Installation and Operation Manual

Jandy® Heat Pumps
Model AE-Ti

⚠ DANGER

RISK OF ELECTRICAL SHOCK OR ELECTROCUTION. The electrical supply to this product must be installed by a licensed or certified electrician in accordance with the National Electrical Code and applicable local codes and ordinances. Improper installation will create an electrical hazard, which could result in death or serious injury to pool or spa users, installers, or others due to electrical shock, and may also cause damage to property. Read and follow the specific instructions inside this manual.

⚠ DANGER

RISQUE DE CHOC ÉLECTRIQUE OU ELECTROCUTION. Cet appareil doit être installé par un électricien certifié conformément au National Electrical Code et aux normes et règlementations locales. Une installation incorrecte peut entraîner un risque de problème électrique (choc électrique ou électrocution) pouvant causer des blessures graves et même la mort des installateurs et/ou utilisateurs de SPA et Piscines. Lire le manuel et se conformer aux directives.

H0569300-

Jandy®

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Section 1.
General Information

1.1 Introduction

This manual provides installation and operation instructions for the Jandy AE-Ti models of Heat Pumps. Read these installation and operation instructions completely before proceeding with the installation. Consult Jandy with any questions regarding this equipment. To obtain additional copies of this manual contact us at 707-776-8200 ext. 237. The following is the address information for Jandy:

2735 NW 63rd Court.
Fort Lauderdale, FL USA 33309

The AE-Ti heat pump gets electrical power from an external source and provides a dual electronic thermostat control system for pool/spa combinations or preheat convenience.

This heat pump is specifically designed for heating fresh water swimming pools and spas. Do not use it as a general service heater. Consult your dealer for the appropriate Jandy products for these applications.

ATTENTION

Installation and service must be performed by a qualified installer or service agency.

To the Installer: After installation, these instructions must be given to the homeowner or left on or near the heat pump.

To the User: This manual contains important information that will help you in operating and maintaining this heat pump. Please retain it for future reference.

1.2 Consumer Information and Safety

The AE-Ti series of heat pumps are designed and manufactured to provide many years of safe and reliable service when installed, operated and maintained according to the information in this manual and the installation codes referred to in later sections. Throughout the manual, safety warnings and cautions are identified by the "⚠" symbol. Be sure to read and comply with all of the warnings and cautions.

1.2.1 Spa/Hot Tub Safety Rules

⚠ WARNING
The U.S. Consumer Product Safety Commission warns that elevated water temperature can be hazardous. Consult heater operation and installation instructions for water temperature guidelines before setting temperature.

⚠ AVERTISSEMENT
La Commission U.S. de Sécurité des Produits pour les Consommateurs indique que des températures de l'eau élevées peuvent être dangereuses. Voir la notice d'installation et de fonctionnement pour le réglage de la température.

⚠ WARNING
The following "Safety Rules for Hot Tubs," recommended by the U.S. Consumer Product Safety Commission, should be observed when using the spa.

⚠ AVERTISSEMENT
Les Règlements suivants pour Cuves Thermales, tel que recommandés par la Commission U.S. de Sécurité des Produits pour les Consommateurs, devraient être respectés lors de l'utilisation du spa.

1. Spa or hot tub water temperature should never exceed 104°F (40°C). One hundred degrees Fahrenheit (100°F [38°C]) is considered safe for a healthy adult. Special caution is recommended for young children.
2. The drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness which could lead to unconsciousness, and subsequently result in drowning.
3. **Pregnant women take note!** Soaking in water above 102°F (38.5°C) can cause fetal damage during the first three months of pregnancy (which could result in the birth of a brain-damaged or deformed child). If pregnant women are going to use a spa or hot tub, they should make sure the water temperature is below 100°F (38°C) maximum.
4. The water temperature should always be checked with an accurate thermometer before entering a spa or hot tub. Temperature controls may vary by as much as 1F° (1C°).

5. Persons with a medical history of heart disease, diabetes, circulatory or blood pressure problems should consult their physician before using a hot tub or spa.
6. Persons taking any medication which induces drowsiness (e.g., tranquilizers, antihistamines, or anticoagulants) should not use spas or hot tubs.
7. Prolonged immersion in hot water can induce hyperthermia.

Hyperthermia occurs when the internal body temperature reaches a level several degrees above the normal body temperature of 98.6°F (37°C). Symptoms include dizziness, fainting, drowsiness, lethargy, and an increase in the internal body temperature. The effects of hyperthermia include:

- Lack of awareness of impending hazard
- Failure to perceive heat
- Failure to recognize need to leave spa
- Physical inability to leave spa
- Fetal damage in pregnant women
- Unconsciousness resulting in a danger of drowning

1.2.2 Swimming Pool Energy Saving Tips

It is important to note that a heat pump will not heat a pool as fast as a large gas or electric pool heater. If the pool water is allowed to cool significantly, it may take several days to return to the desired swimming temperature. For weekend use, it is *more economical* to maintain the pool water temperature at or near your desired swimming temperature. If you do *not* plan to use your pool for a prolonged period, then you might choose to turn the heat pump completely off *or* decrease the temperature setting of the control several degrees to minimize energy consumption.

Jandy offers the following recommendations to help conserve energy and minimize the cost of operating your heat pump without sacrificing comfort.

1. The American Red Cross recommends a maximum water temperature of 78°F (25°C). Use an accurate pool thermometer. A difference of 4°F (2°C) , between 78°F and 82°F (26°C and 28°C), will significantly increase energy consumption.
2. Carefully monitor the water temperature of your pool in the summertime. You can reduce heat pump usage due to warmer air temperatures.
3. During the winter or when on vacation for longer than a week, turn off the heat pump.
4. Find the proper setting on the heat pump temperature control and use the Keypad Lock function or lock the smoke-colored cover on the heat pump controller to discourage further adjustments.
5. Set the pump time clock to start the pump no earlier than 6:00 AM during the pool heating season. This is the time when nightly heat loss balances.
6. Where possible, shelter the pool from prevailing winds with well-trimmed hedges or other landscaping, cabanas, or fencing.
7. Always use a pool cover when practical. Besides providing a valuable safety feature, a pool cover will reduce heat loss, conserve chemicals, and reduce the load on filter systems.

1.3 Warranty

The AE-Ti heat pump is sold with a limited factory warranty. Details are specified on the back cover of this manual.

Make all warranty claims to an authorized Jandy dealer or directly to the factory. Claims must include the heat pump serial number and model (this information can be found on the rating plate), installation date, and name of the installer. Shipping costs are not included in the warranty coverage.

The warranty does not cover damage caused by improper assembly, installation, operation, winterizing, field modification, or failure to earth bond and properly ground the unit. Any changes to the heat pump, evaporator, heat exchanger, wiring, or improper installation may void the warranty.

1.4 Codes and Standards

The AE-Ti heat pump is listed by ETL as complying with the latest edition of the “UL Standard for Safety for Heating and Cooling Equipment”, UL 1995 and CSA C22.2 No. 236.

All Jandy heat pumps must be installed in accordance with the local building and installation codes as per the utility or authority having jurisdiction. All local codes take precedence over national codes. In

the absence of local codes, refer to the latest edition of the National Electric Code (NEC) in the United States and the Canadian Electric Code (CEC) in Canada for installation.

1.5 Technical Assistance

Consult Jandy Technical Support Department or your local Jandy dealer with any questions or problems involving the specifications, installation, and operation of your Jandy equipment. An experienced technical support staff is ready to assist you in assuring the proper performance and application of Jandy products. For technical support call the Jandy Heat Pumps Technical Service Department at (954) 970-4800

1.6 Materials Needed For Installation

1.6.1 Materials for All Installations

The following items are needed and are to be supplied by the installer for ***all*** heat pump installations:

1. Plumbing connections (2”).
2. Level surface for proper drainage.
3. Suitable electrical supply line. See rating plate on unit for electrical specifications. A junction box is not needed at the heat pump; connections are made inside of the heat pump electrical compartment. Conduit may be attached directly to the heat pump jacket.

NOTE: Flex conduit is recommended for connecting the electrical supply wires to the heat pump so that the front panel may be removed easily for servicing.

4. Electric cutout switch that will interrupt all power to the unit. This switch *must* be within line of sight of the heat pump.
5. Watertight conduit to run the electrical supply line.

1.6.2 Recommended Materials for Installations

Jandy recommends installing isolation valves on the inlet and outlet water connections for ease of serviceability.

1.7 Specifications

1.7.1 General Specifications

Installation Location		
Certified for use in:		
USA	Indoor/Outdoor approved	
Canada	Indoor/Outdoor approved	
Mexico	Indoor/Outdoor approved	
Central and South America	Indoor/Outdoor approved	
Water Pipe/Heater Connection		
Plastic	2” PVC (Unions included)	
Flow Rate		
Maximum	125 gpm (475 lpm)	
Minimum	30 gpm (110 lpm)	
Maximum Working Water Pressure	75 psi	
Electrical Supply		
Voltage Requirements		
1-Phase	208/230 VAC 60Hz	
3-Phase	208/230/380/460 VAC, 50/60 Hz, (Model dependent)	
Amperage Protection Requirements	1-Phase	3-Phase
AE2000	40 A	30 A
AE2500	50 A	30 A
AE3000	50 A	30 A

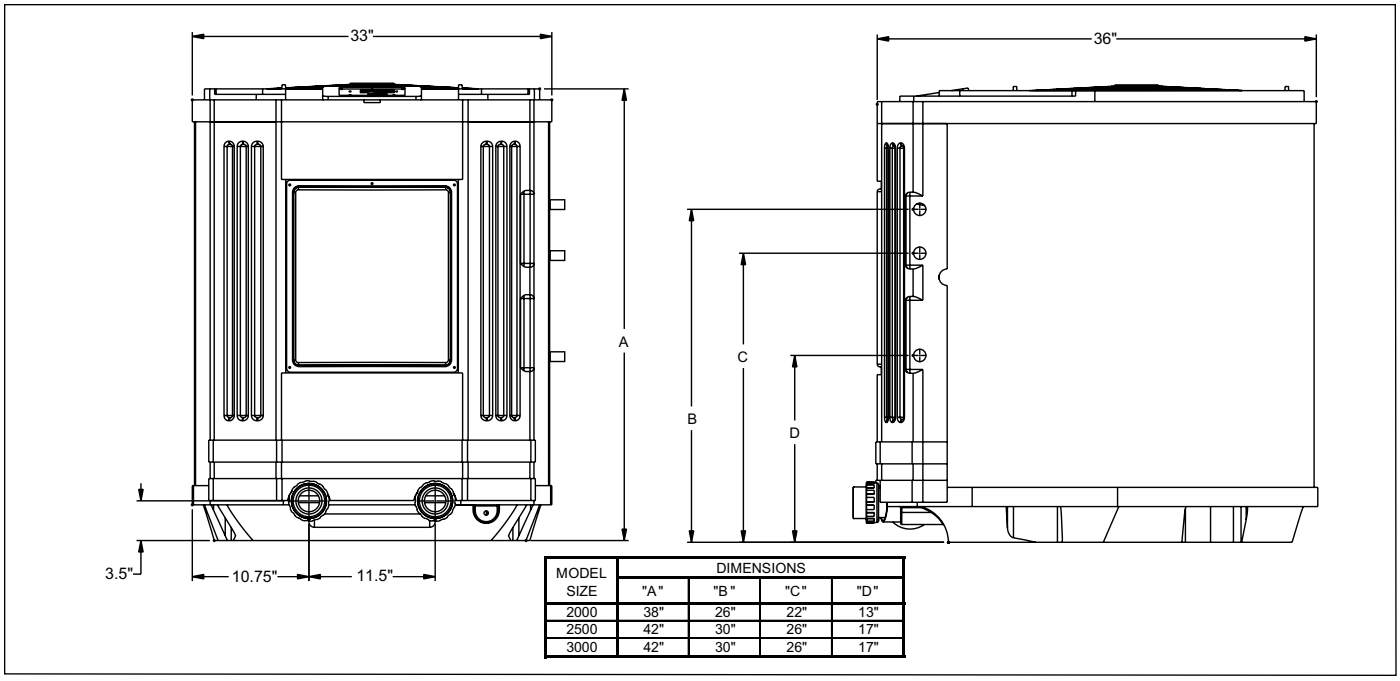
1.7.2 Dimensions

See Figure 1 for a diagram showing the heat pump’s dimensions and for dimensions to critical connections.

Section 2. Installation Instructions

2.1 General Information

Install the Jandy heat pumps in accordance with the procedures in this manual, local codes and ordinances, and in accordance with the latest edition of the appropriate national code. (See Section 1.4, “Codes and Standards”.)



MODEL SIZE	DIMENSIONS			
	"A"	"B"	"C"	"D"
2000	38"	26"	22"	13"
2500	42"	30"	26"	17"
3000	42"	30"	26"	17"

Figure 1. Jandy AE-Ti Heat Pumps Dimensions

Correct installation is required to assure safe operation. The requirements for Jandy heat pumps include the following:

1. Field assembly (if required).
2. Appropriate site location and clearances.
3. Sufficient air ventilation.
4. Proper electrical wiring.
5. Adequate water flow.

This manual provides the information needed to meet these requirements. Review all application and installation procedures completely before continuing the installation.

2.2 Location Requirements

2.2.1 Introduction

NOTE: Indoor installations require special considerations for condensate drainage and venting the cold air produced by the heat pump. Contact the Jandy Heat Pump Technical Service Department at (954) 970-4800.

⚠ CAUTION

When pool equipment is located below the pool surface, a leak from any component can cause large scale water loss or flooding. Waterpik Technologies cannot be responsible for such water loss or flooding or resulting damage.

⚠ ATTENTION

Lorsque l'équipement d'une piscine est situé sous la surface de l'eau, une fuite provenant de n'importe quel élément peut causer une perte d'eau importante ou une inondation. Waterpik Technologies n'est pas responsable des pertes d'eau, des inondations ou des avaries causées par une installation ou un entretien inadéquat.

Avoid placing the heat pump in locations where it can cause damage by water or condensate leakage. If this is not possible, provide a suitable drain pan to catch and divert any leakage.

All criteria given in the following sections reflect minimum clearances. However, each installation must also be evaluated, taking into account the prevailing local conditions such as proximity and height of walls, and proximity to public access areas.

2.2.2 Clearances

The heat pump must be placed to provide clearances on all sides for maintenance and inspection. See Table 1.

At least 24" (61cm) access must be available in front of the heat pump for service.

If the heat pump is to be installed in a garage or under a vertical overhang, the unit must have a minimum of 5 feet clearance from the top of the heat pump.

This heat pump must be installed at least 5 feet (1.52 meters) from the inside wall of the pool or spa unless the heat pump is separated from the pool or spa by a 5 foot high solid fence or other permanent barrier.

Table 1. Heat Pump Clearances

Side of Heat pump	Minimum Clearances for Operation		Recommended Clearances for Serviceability	
	Inches	Centimeters	Inches	Centimeters
Front	6	15	24	60
Rear	6	15	12	30
Left	6	15	12	30
Right	6	15	12	30
Top	60	150	60	150

Note: Clearances listed in Table 1 are manufacturer's tested values. These are given as minimum values. Where local and national codes apply, and values are different than those listed in Table 1, use the greater value to ensure safe and proper operation.

Ce chauffe-piscine doit être installé á au moins 5 pieds (1.52m) de la paroi interne de la piscine à moins d'être isolé de la piscine par une clôture, un mur ou autre barrière permanente.

2.2.3 Equipment Pad

Place the heat pump on a flat slightly pitched surface, such as a concrete or fabricated slab (pad). This allows proper drainage of condensation and rain water from the base of the unit. If possible, the pad should be placed at the same level or slightly higher than the filter system equipment pad.

NOTE Ensure that the pad is pitched not more than ¼ inch per foot toward the compressor end (front) of the heat pump. Pitch slab from back to front ¼ inch per foot maximum and level from side to side.

2.2.4 Condensation and Drainage

Condensation will occur from the evaporator coil while the unit is running and drain at a steady rate, usually three to five gallons per hour, depending upon ambient air temperature and humidity. The more humid the ambient conditions, the more condensation will be produced. The bottom of the unit acts as a tray to catch rainwater and condensation. Keep the drain hole located on the right side of the base of the unit clear of debris.

If the heat pump is installed indoor a means of condensate disposal must be provided. The drain hole in the base of the heat pump is fitted with a 5/8" diameter barbed adapter. Connect a length of 5/8" tubing or garden hose to the adapter and route it to dispose of the condensate into a drain or outside of the building. It is important to remember that no part of the tubing or hose may be above the level of the drain hole in the base of the heat pump.

2.2.5 Lawn Sprinklers

Keep lawn sprinkler heads from spraying on the heat pump to prevent corrosion and damage. Use a deflector if needed.

2.2.6 Roof Run-off

Make sure the heat pump is not located where large amounts of water may run-off from a roof into the unit. Sharp sloping roofs without gutters will allow massive amounts of rain water, mixed with debris from the roof to be forced through the unit. A gutter or down spout may be needed to protect the heat pump.

2.2.7 Installation of Anchor Clamps

In Florida, building codes require that the heat pump be anchored to the equipment pad or platform to withstand high wind pressures created during hurricanes.

This heat pump was provided with anchor clamps designed to hold the unit to the equipment pad in high wind conditions. Installation of the anchor clamps is recommended in all installations and are required in Florida (See Florida Building Code 301.13).

To install the anchor clamps:

1. Be sure that the heat pump is in its permanent location on the equipment pad.
2. Remove the anchor clamps from the installation and instruction package.

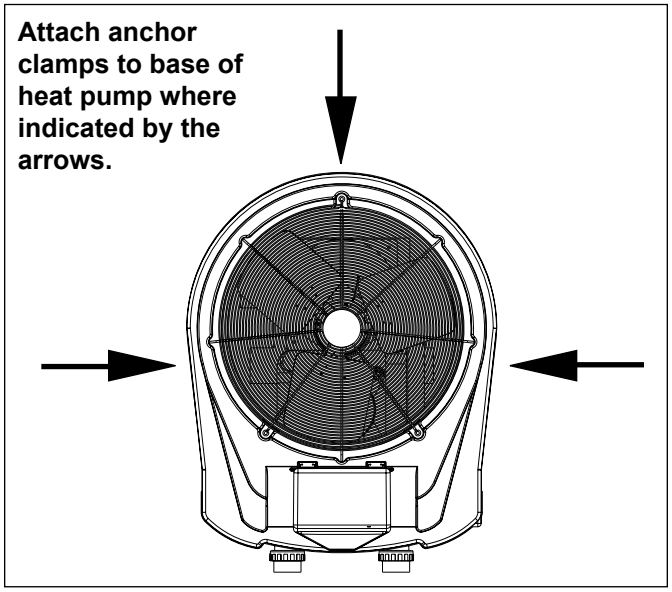


Figure 2. Anchor Clamp Positions

Note: Bolts and bolt anchors are not included with the heat pump. The installer must provide 1/4" x 1-3/8" stainless steel anchor bolts and the appropriate size concrete anchor to mount the clamp to the equipment pad.

3. Place the clamps at the base of the heat pump in the locations indicated in Figure 2.

4. Fit the hook of each clamp over the lip on the base panel of the heat pump. The hook should fit between the lip of the base panel and the evaporator coil guard (see Figure 3).

5. Mark the position of the hole in each clamp on the equipment pad.

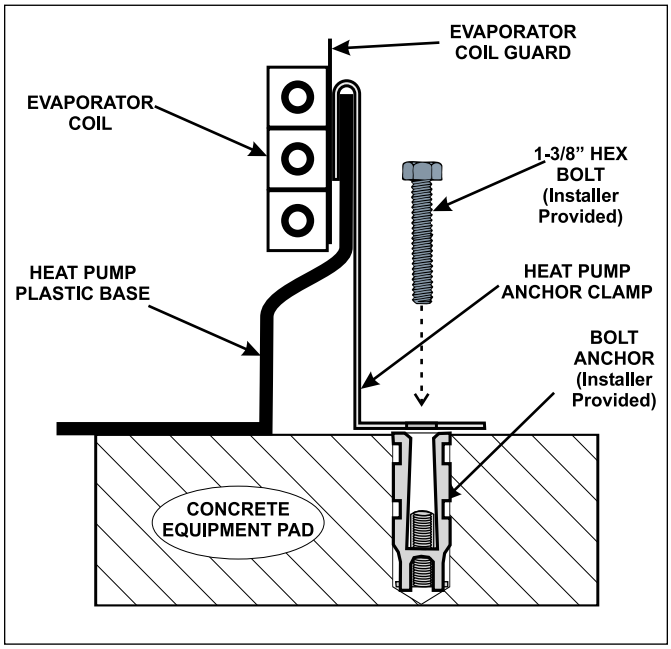


Figure 3. Anchor Clamp Installation

6. Drill a hole in the cement using a masonry drill bit, with a diameter as determined by the concrete anchor, at each of the marks on the equipment pad. The hole should be approximately 1-1/2" deep.

7. Insert a bolt anchor into each of the holes. Be sure the anchors are set completely into the holes

8. Position the anchor clamps so that the holes in the clamps are over the bolt anchors. Be sure that the clamp hooks are over the lip of the heat pump base (see Figure 3)

9. Insert an anchor bolt through each clamp into the anchor and tighten to secure the clamp and heat pump to the equipment pad.

Section 3. Water Connections

3.1 Plumbing Layout

Figure 4 illustrates the standard plumbing layout with a single heat pump unit. Following the diagram from right to left, the plumbing sequence is as follows:

Pool > Pool Pump > Filter > Heat Pump > Check Valve > Chemical Loop > Chlorinator > Pool

NOTE For normal installations, do not install a shutoff valve or any kind of variable restriction in the water piping between the heat pump outlet and the pool/spa.

The heat pump must be protected from back-siphoning of water. If there is any chance of back-siphoning, provide a check valve between the pool and the filter pump inlet. Arrangement of pool system components other than as illustrated in the preceding

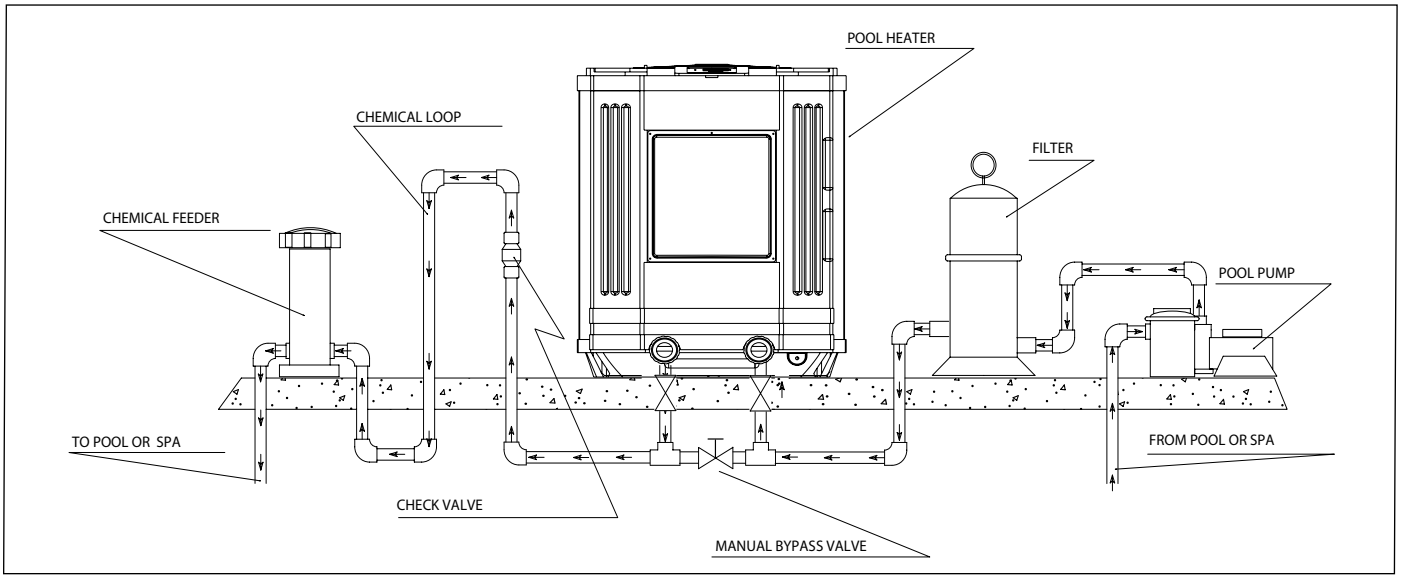


Figure 4. Standard Plumbing Layout

and following diagrams can affect the operation of the heat pump's water pressure switch. Location of the heat pump above or below the pool water surface can also affect operation of the switch. In general, the pressure switch can be adjusted to accommodate this effect if the heat pump water connections are no more than six feet below the pool water surface or no more than 15 feet above it. See instructions for pressure switch adjustment (Section 5.7) in the heat pump start-up section of this manual for more information. If the heat pump is installed outside of this range, an external pressure switch may need to be installed in the plumbing upstream of the heat pump. Call the Jandy Heat Pump Technical Service department at (954) 970-4800 for details.

Be advised that when pool equipment is located below the pool surface a leak can result in large scale water loss or flooding. Jandy cannot be responsible for such water loss or flooding or the damage caused by either occurrence.

3.2 Water Connections at Heat Pump

Shipping plugs have been installed in the water inlet and outlet ports of the heat pump at the factory. Before installing any plumbing, remove the shipping plugs. Filtered water is plumbed to the inlet, located on the right side of the heat pump front panel. Heated water flows through the outlet, located on the left side of the heat pump front. Two inch unions are provided.

Plastic piping (PVC Schedule 40) should be connected to the heat pump. The unions, provided with the unit, accept 2" PVC pipe.

CAUTION

Make sure that flow requirements and pool water turn over rates can be maintained with the installation of additional heat pumps and plumbing restrictions.

ATTENTION

Assurez-vous que la circulation d'eau requise soit maintenue même si des pompes d'appoints ou des éléments de plomberie, causant des restrictions, sont ajoutés.

3.3 Check Valve Installation

The heat pump must be protected from back-siphoning of water. If there is any chance of back-siphoning, provide a check valve between the pool and the filter pump inlet.

When an automatic chemical feeder is installed in the plumbing, it must be installed downstream of the heat pump. A check valve must be installed between the heat pump and the chemical feeder to prevent back-siphoning of chemically saturated water into the heat pump where it will damage the components.

3.4 Automatic Flow Control Valve

The inlet/outlet header of the AE-Ti heat pump comes equipped with an internal automatic flow control valve. The automatic flow control valve maintains the proper flow through the heat pump at rates up to approximately 125 gpm (475 lpm). If the filter system flow rate is higher than approximately 125 gpm (475 lpm), install a manual bypass valve (see Figure 4).

NOTE Be advised that if your circulation pump is over 2 HP *or* if the total flow exceeds 125 gpm, you will have to add an external bypass valve. Excess water flow will damage the heat exchanger.

3.5 Multiple Unit Installation

3.5.1 Heat Pump and Heater Combination

In certain regions of the country it may be more economical to run a heat pump during the warmer months and a gas heater during the cooler months. In some situations it may be desirable to run the heat pump in the "Chiller" mode during the hottest portion of the year and a heater during the cooler months. The Jandy heat pump may be plumbed with a gas or electric heater or any combination of heat sources including solar. All heat sources must be plumbed in parallel to work correctly and efficiently.

Figure 5 illustrates a recommended plumbing layout for a heat pump / heater / solar combination heating system for a pool / spa combination. Your system may not contain all of these components, but the basic plumbing will apply by eliminating the component in the illustration that is not a part of your system.

3.5.2 Multiple Heat Pump Connections

All plumbing on multiple heat pump installations must be done in parallel (see Figures 6 through 9). An equal flow of water to each heat pump is important for optimum operation.

NOTE It may be necessary to adjust water pressure switch if a unit is installed below the water level. See Section 5.7 for details on when and how to adjust the pressure switch.

NOTE Each heat pump allows a maximum flow rate of 125 gpm and requires a minimum of 30 gpm.

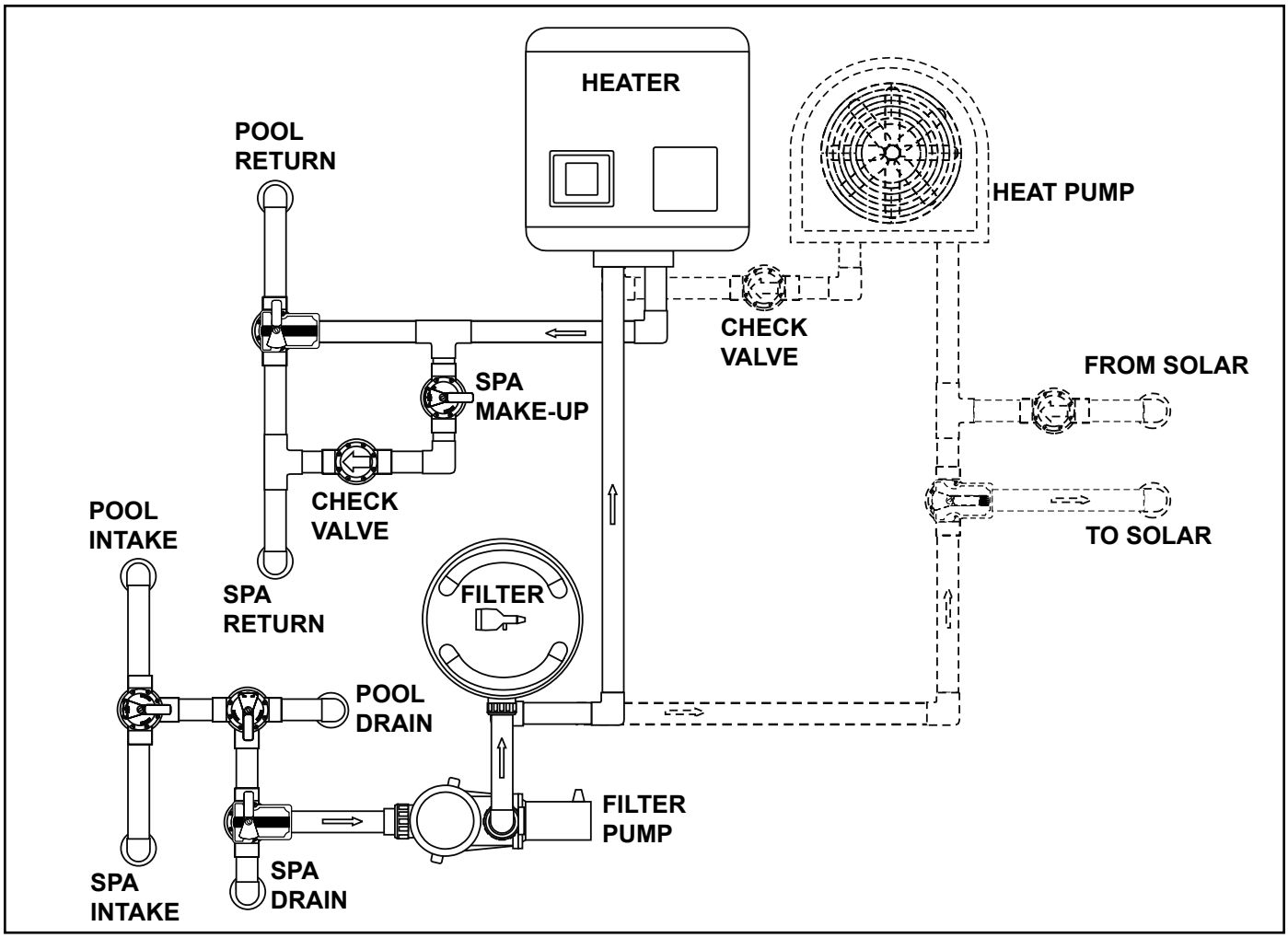


Figure 5. Plumbing For Heating System Combinations

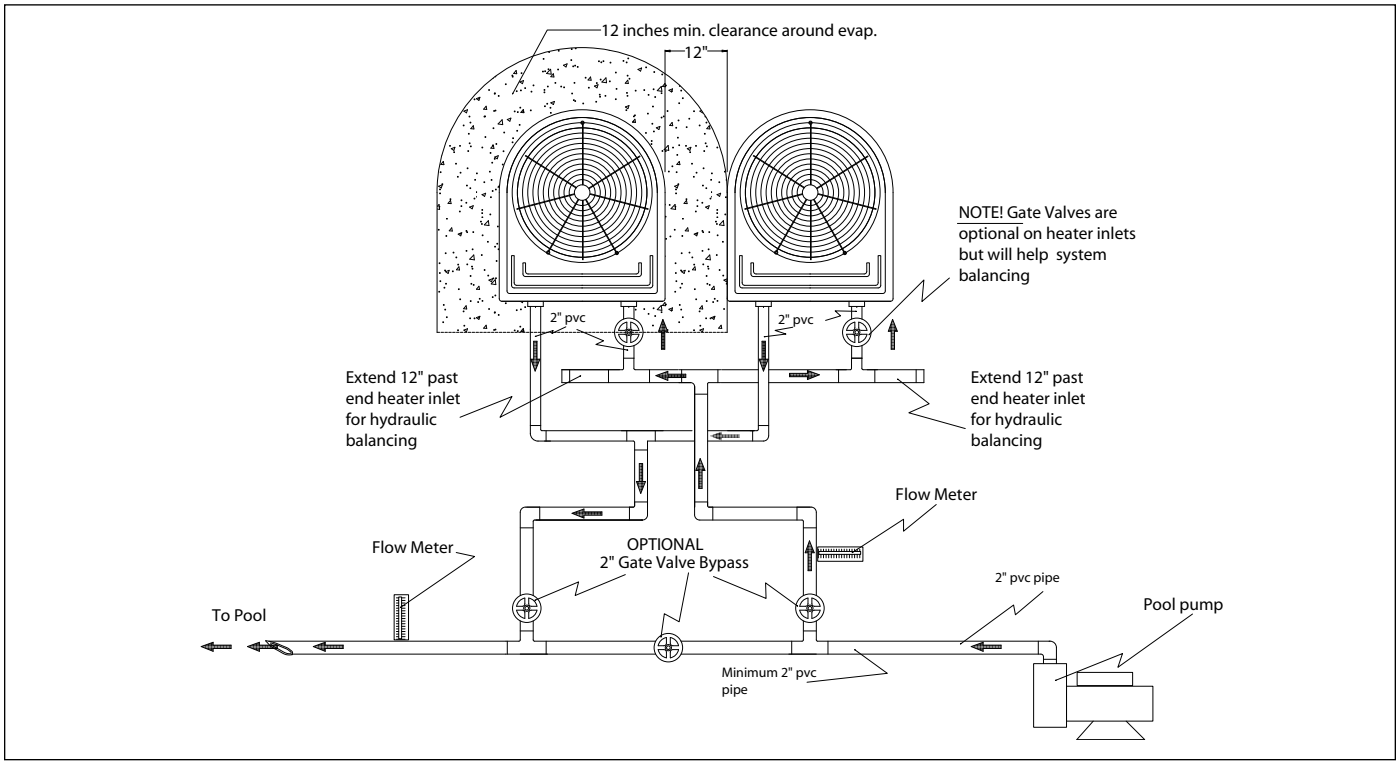

12 inches min. clearance around evap.
12"
NOTE! Gate Valves are optional on heater inlets but will help system balancing
2" pvc
2" pvc
Extend 12" past end heater inlet for hydraulic balancing
Extend 12" past end heater inlet for hydraulic balancing
Flow Meter
Flow Meter
OPTIONAL 2" Gate Valve Bypass
2" pvc pipe
Pool pump
To Pool
Minimum 2" pvc pipe

Figure 6. Two Heat Pump Plumbing Layout

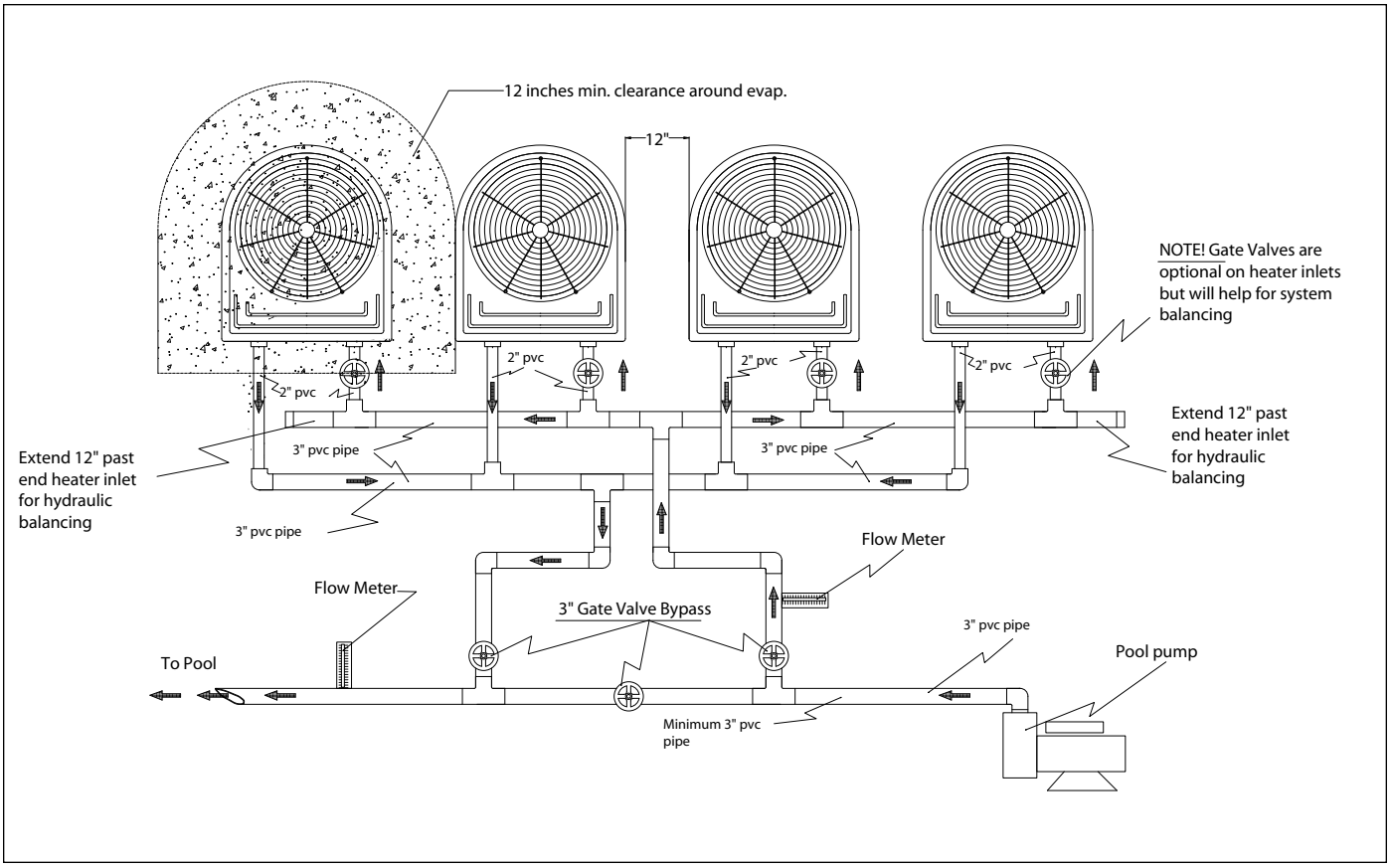


Figure 7. Four Heat Pump Plumbing Layout

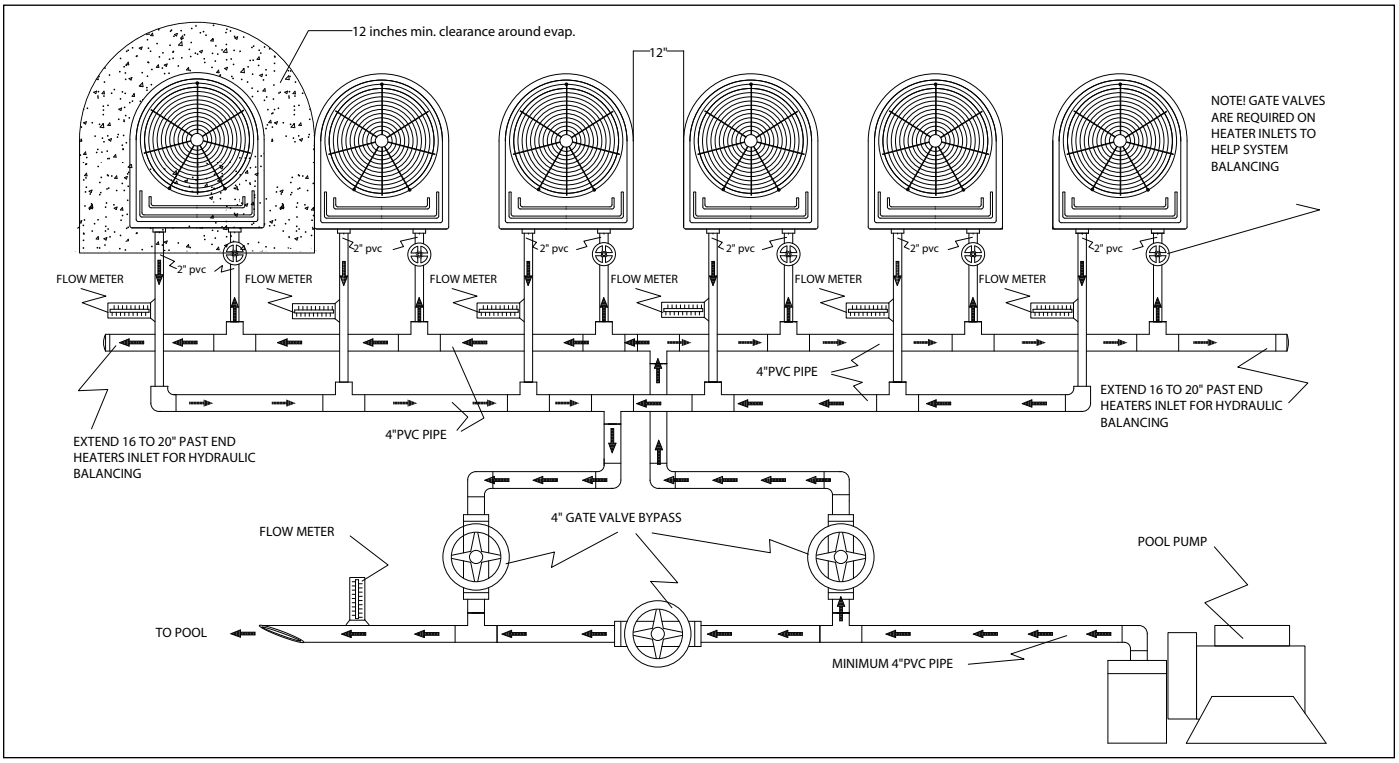

12 inches min. clearance around evap.
12"
NOTE! GATE VALVES ARE REQUIRED ON HEATER INLETS TO HELP SYSTEM BALANCING
2" pvc
FLOW METER
4"PVC PIPE
EXTEND 16 TO 20" PAST END HEATERS INLET FOR HYDRAULIC BALANCING
EXTEND 16 TO 20" PAST END HEATERS INLET FOR HYDRAULIC BALANCING
4" GATE VALVE BYPASS
FLOW METER
POOL PUMP
TO POOL
MINIMUM 4"PVC PIPE

Figure 8. Six Heat Pump Plumbing Layout

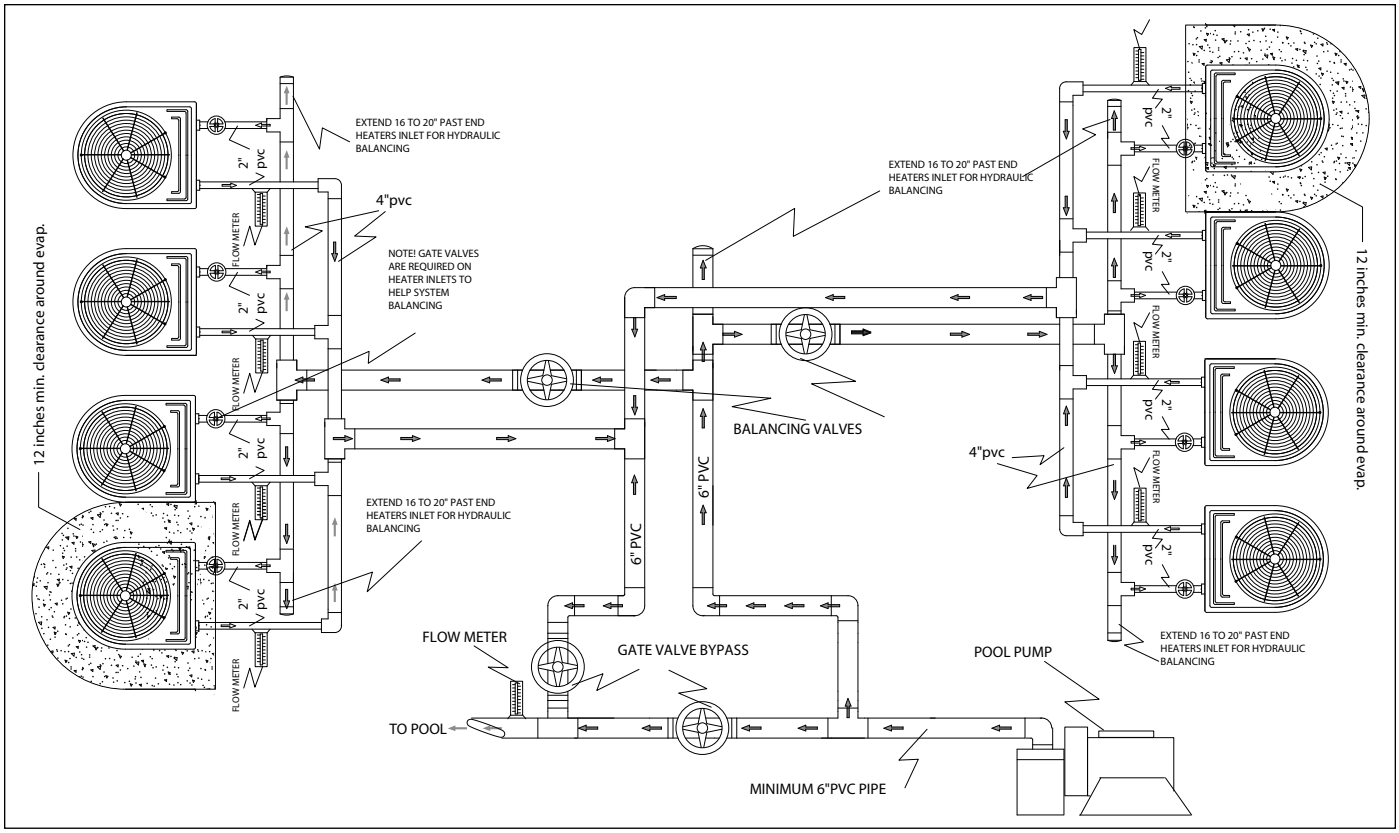


Figure 9. Eight Heat Pump Plumbing Layout (Dual Headers)

Section 4. Electrical Connections

⚠ WARNING

ELECTRICAL SHOCK HAZARD. This heat pump contains wiring that carries high voltage. Contact with these wires may result in severe injury or death. Disconnect power circuit before connecting the heat pump

⚠ AVERTISSEMENT

POSSIBILITÉ DE CHOCS ÉLECTRIQUES. Ce système de chauffage contient du filage de haut voltage. Un contact avec ces fils peut résulter en des blessures sérieuses ou la mort. Débranchez le circuit de puissance avant de relier la pompe à chaleur

⚠ CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

⚠ ATTENTION

Au moment de l'entretien des commandes, étiquetez tous les fils avant de les débrancher. Des erreurs de câblage peuvent entraîner un fonctionnement inadéquat et dangereux.

4.1 General Information

Wiring connections must be made exactly as shown in the wiring diagram found on the inside of the heat pump access panel (see Figure 10 for single phase electrical wiring and Figure 11 for 3-phase electrical wiring). The heat pump must include a definite means of grounding and bonding. There is a bonding lug on the right side of the heat pump, where a bond wire must be attached.

4.2 Main Power

Electrical wiring to the heat pump must be in accordance with the latest edition of the National Electric Code (NEC), ANSI/National Fire Protection Association (NFPA) 70 in the United States, and in Canada, the Canadian Electrical Code (CEC) C22.1, unless local code requirements indicate otherwise.

The heat pumps come factory-wired intended for use with either 208/230, 380, or 460 VAC, 60 Hz field electrical supply depending on the model. See the rating plate for the electrical specifications. All wiring must be done by a certified electrician.

The following is the procedure to wire the AE-Ti to the electrical source specified on the Rating Plate:

1. Be sure the power to the circuit for the heat pump is turned off
2. Remove the 5 screws that attach the service/access panel to the heat pump unit (see Figure 12 on page 15).
3. Electrical supply lines must be run through watertight conduit. Run the wires and conduit from the power source and connect them to the conduit connection labeled “High Voltage Connection” on the right side of the heat pump. See Figure 12 for connection location.
4. Connect the wires to the terminals on the main contactor as shown in the wiring diagram.
5. Connect the ground wire to the ground lug provided in the electrical compartment.
6. Replace the service access panel and replace the screws to hold it in place.
6. Connect a copper bonding wire (8 AWG) to the bonding lug on the right side of the heat pump.

4.3 Bonding

⚠ CAUTION

This heater must be connected to a bonding grid with a solid copper wire not smaller in diameter than 8 ga.

⚠ ATTENTION

L’appareil de chauffage doit être connecté à une grille de mise à la terre par un fil de cuivre d’un diamètre de calibre minimal 8.

The National Electrical Code and most other codes require that all metallic components of a pool structure, including reinforcing steel, metal fittings, and above ground equipment be bonded together with a solid copper conductor not smaller than 8 AWG. The heat pump, along with pumps and other pool equipment must be connected to this bonding grid. A bonding lug is provided on the right hand side of the heat pump to ensure this requirement is met.

4.4 Pump Connection (Auto-Heat Feature)

(***Residential only***) When connecting the time clock override parallel circuit, proper phasing must be maintained. Use 12 AWG wire. Follow the wiring diagram on the service access panel of your heat pump, referring to the auto-contactor section. The use of four different color wires will help in maintaining the proper phasing to and from the pool pump time clock.

4.5 Optional Remote Controls

Electrical wiring must be in accordance with the latest edition of the NEC (NFPA 70) in the United States and CEC (CSA 22.1) in Canada, unless local code requirements indicate otherwise. To connect remote control equipment to the heat pump, perform the following steps:

1. **Turn off the power to both the pool/spa control system and the heat pump unit.**
2. Remove the 5 screws that attach the service/access panel to the heat pump unit (see Figure 12). This will allow you to access the wires from the AE-Ti control panel for the remote control installation.
3. Run the wires from the pool/spa control system into the conduit connection labeled “Low Voltage Connection”, located on the lower right hand side of the heat pump (see Figure 12).
4. Strip approximately 1/4” of insulation from the heat pump remote control wires (black and white).
5. Using wire nuts, connect the wiring from the pool/spa control system to the heat pump remote control wires.
6. Restore power to the heat pump and the pool/spa control system.

NOTE For AquaSwitch® or three wire remote controls, connect the HIGH and COMMON wires to the heat pump remote control wires.
For AquaLink® RS, refer to the section labeled ”Guidelines for a Gas Heater and a Jandy AE Series Heat Pump/Chiller installation in the AquaLink RS installation manual.

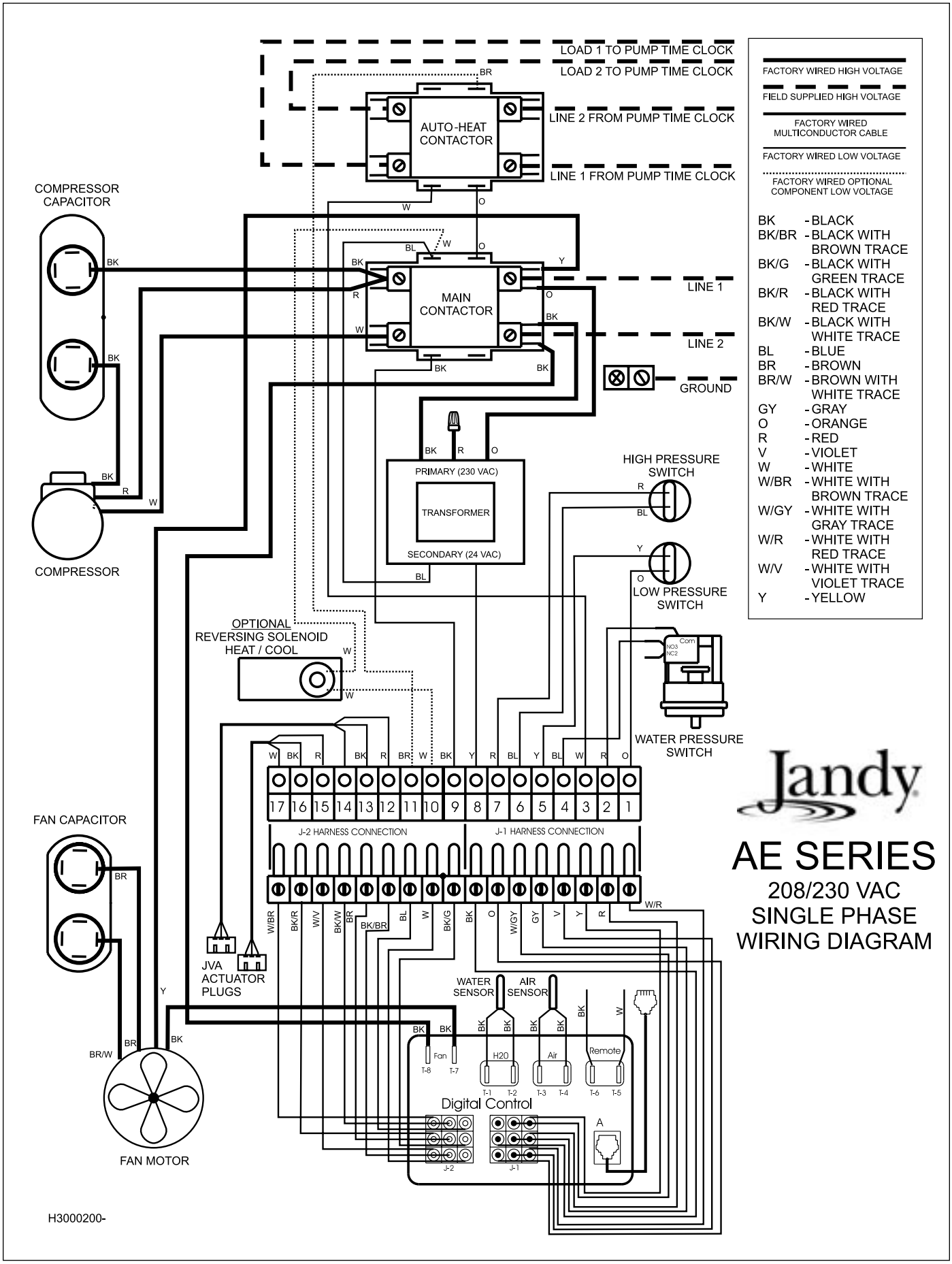


Figure 10. AE-Ti Single-Phase Electrical Supply Wiring Diagram

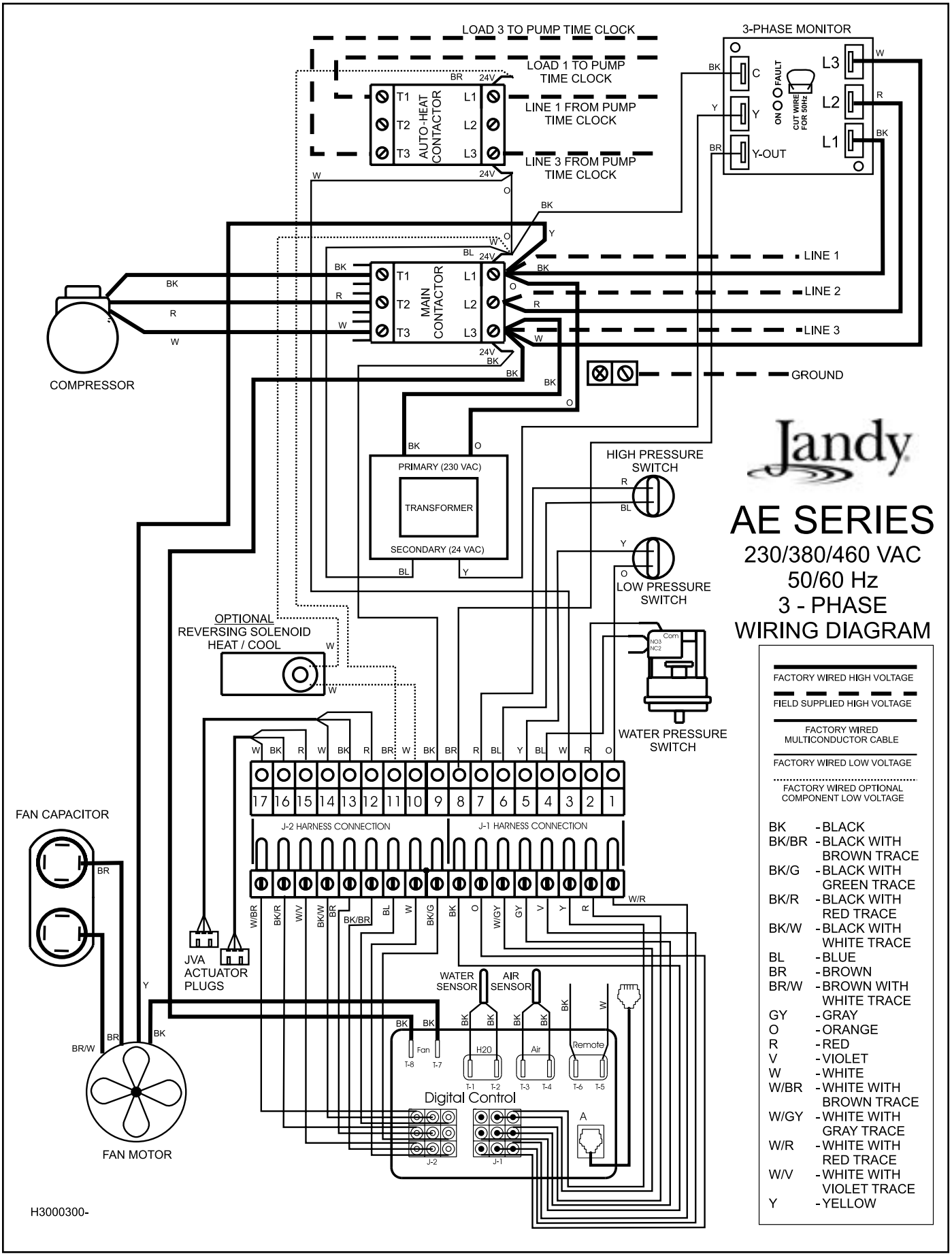


Figure 11. AE-Ti 3-Phase Electrical Supply Wiring Diagram

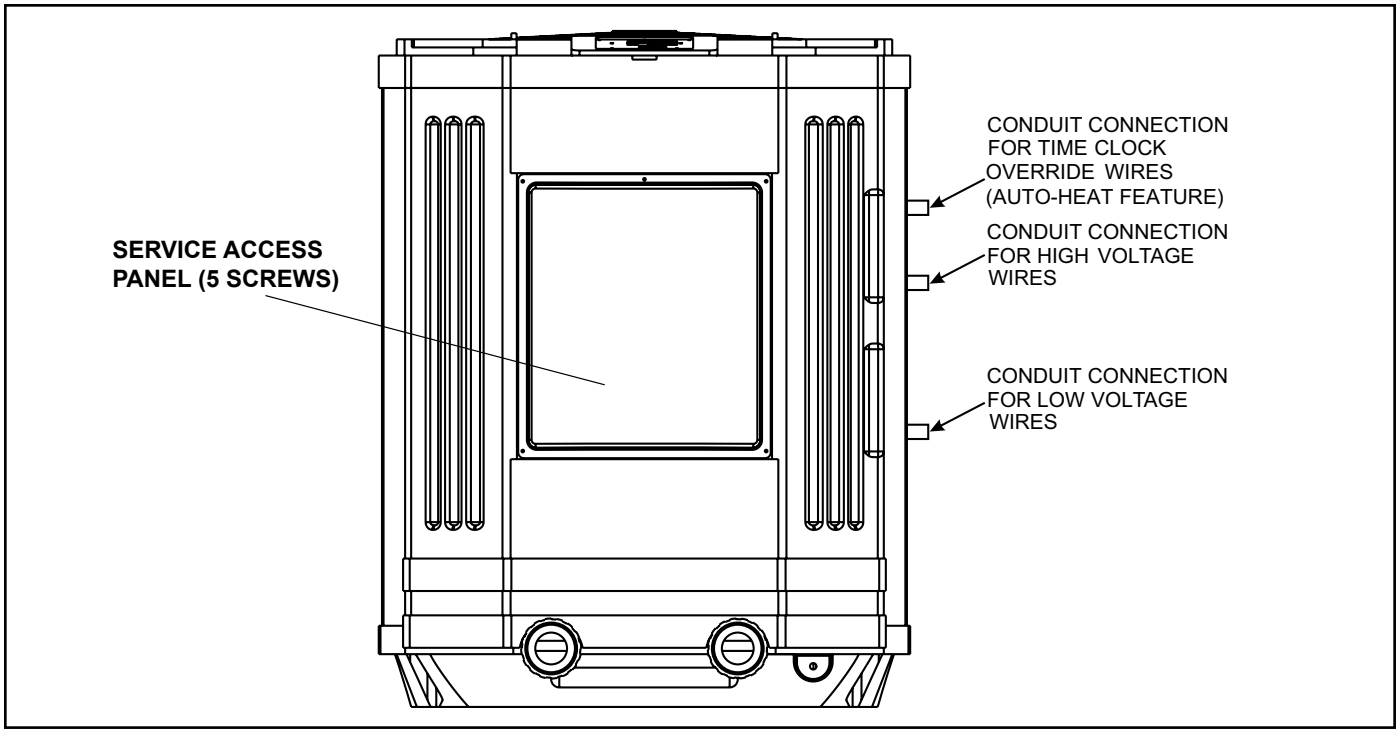


Figure 12. AE-Ti Heat Pump Front View

Section 5. Operation

⚠ CAUTION

Do not use this heat pump if any part has been under water. Immediately call a qualified service technician to inspect the heater and replace any part of the control system which has been under water.

⚠ ATTENTION

N'utilisez pas cet appareil s'il a été plongé dans l'eau, même partiellement. Faites inspecter l'appareil par un technicien qualifié et remplacez toute partie du système de contrôle et toute commande qui ont été plongés dans l'eau.

⚠ CAUTION

Keep all objects off the top of the heat pump. Blocking air flow could damage the unit and may void the warranty.

⚠ ATTENTION

Ne posez aucun objet sur le dessus de l'appareil. Il pourrait empêcher la circulation de l'air, ce qui risquerait d'endommager l'appareil et d'annuler la garantie.

5.1 Initial Start-up Precautions

ATTENTION

After starting the AE-Ti heat pump, please note that there is a 5 minute delay before the compressor begins operation. The heat pump display will show the remaining delay time in minutes.

Be sure that there is water in the pool and that the surface level is above the skimmer or other inlet of the pool's filter system.

With any new pool or spa installation, operate the filter pump with the heat pump off long enough to completely clean the water. This will remove any installation residue from the water. Clean the filter at the end of this operation before starting the heat pump. When raising the temperature of a cold pool, program the time clock to run the pump continuously. This lets the filter system and heat pump operate continuously until the water reaches the temperature setting on the temperature control. When that happens, the heat pump will automatically shut off, but the filter pump will keep running.

5.2 Operating the Controller

Your new AE-Ti heat pump is controlled by an advanced microprocessor based controller that provides a sophisticated yet simple interface to operate your heat pump for maximum efficiency and enjoyment of your pool. To locate the control buttons, see Figure 13.

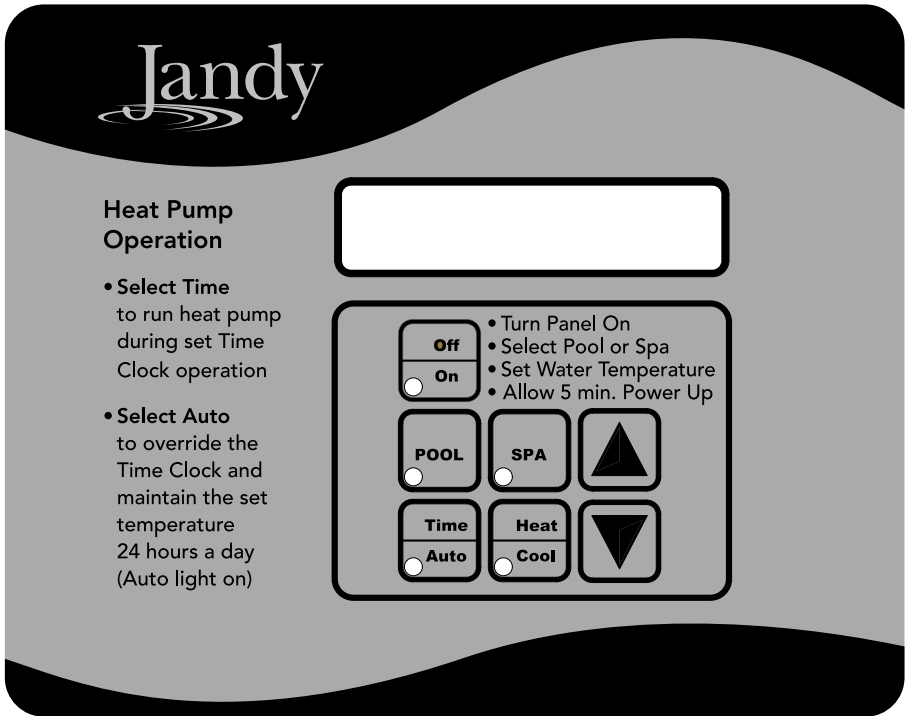


Figure 13. Main Control Panel

5.2.1 Off/On Button

When the control panel is turned off, the screen displays **CONTROL IS OFF** and the **Off/On** LED indicator is not lit. Press **Off/On** to turn on the control panel. The LED will light and the display will read **PLEASE SELECT POOL OR SPA**.

5.2.2 Pool Mode - (Normal Heat)

To enable the pool mode, press **POOL**. The LED indicator will light and the unit will display **POOL TEMPERATURE SET-POINT = XX°** for 5 seconds.

NOTE *XX* represents the current temperature setting on the control. The default setting for pool temperature is 82°F.

After 5 seconds the unit will display **POOL → HEAT** and the current pool temperature**.** You can change the temperature set point by pressing the **Up** or **Down** button. The display will change back to show **POOL TEMPERATURE SET-POINT = XX°.** Repeatedly press the **Up** or **Down** button until you reach the desired temperature set point. After 5 seconds of inactivity, the new set point is stored in memory. When the water temperature falls to 1 degree below the temperature setting *and* after a 5- minute delay, the control will start the heat pump.

5.2.3 Pool Mode - (Optional Auto Heat)

If connected, the Auto-Heat mode allows the heat pump to monitor the temperature of the water 24 hours a day by turning the pool pump on and sampling the water temperature. When the water temperature drops below the programmed temperature set point, the control will start the heat pump.

To operate in pool mode with the Heat Auto-Run feature, press **POOL**, then press **Time/Auto**. The LED indicators on both buttons will light and the unit will display **POOL TEMPERATURE SET-POINT = XX°** for 5 seconds. Change the temperature set point by pressing the **Up** or **Down** buttons until the desired set point is displayed. After 5 seconds of inactivity the unit will display **POOL →AUTO-HEAT** along with the current pool temperature and the delay time remaining until the heat pump starts.

5.2.4 Spa Mode - (Optional Auto Heat)

If connected, the spa mode automatically enables the Auto-Run feature. Press **SPA** to enable spa mode. The LED indicator will light and the unit will display **SPA TEMPERATURE SET-POINT = XX°** for 5 seconds. Change the temperature set point by pressing the **Up** or **Down** buttons until the desired set point is displayed. After 5 seconds of inactivity the display will read **SPA →AUTO-HEAT** along with the current spa temperature and the delay time left until the heat pump starts. Additionally, the new set point will be stored in memory. The default factory setting for Spa temperature is 104 degrees.

5.2.5 Keypad Lockout

To lockout the keypad *in any operating mode*, press and hold the **POOL**, **SPA**, and **Heat/Cool** buttons for 6 seconds. All control buttons will be disabled and

the control will operate in the mode it was in when the keypad lockout occurred. If any button is pressed when the keypad is in lockout mode, the unit will display **SYSTEM LOCKED** for 5 seconds. To unlock the keypad, press and hold the **POOL**, **SPA**, and **Heat/Cool** buttons for 6 seconds. The unit will display **SYSTEM UNLOCKED**.

5.2.6 Feature Lockout

To lockout all features *except* the **On/Off, POOL** and **SPA** buttons *in any operating mode*, press and hold the **Time/Auto, Heat/Cool** and **Down** buttons for 6 seconds. All control buttons except the **On/Off, POOL** and **SPA** will be disabled. If any button is pressed when the keypad is in feature lockout mode, the unit will display **FEATURE LOCKED** for 5 seconds. To unlock the keypad, press and hold the **Time/Auto, Heat/Cool** and **Down** buttons for 6 seconds. The unit will display **FEATURE UNLOCKED**.

5.3 Operating Features of Units with Optional Chiller

5.3.1 Pool Mode - (Normal Cool)

To operate in Pool-Cool mode, press **POOL**. The LED indicator will light and the unit will display the message **POOL TEMPERATURE SET-POINT = XX°** for 5 seconds.

After 5 seconds the display will read **POOL → HEAT** and the current pool temperature**.** Press **Heat-Cool**. The unit will display **POOL TEMPERATURE SET-POINT = XX°** for 5 seconds. You can change the set point by pressing the **Up** or **Down** buttons until the desired set point is displayed. After 5 seconds of inactivity, the display will read **POOL-COOL** along with the current pool temperature and the delay time remaining until the chiller starts. Additionally, the new set point will be stored in memory. When the water temperature rises to 1 degree above the temperature setting *and* after a time delay of 5 minutes, the control will turn on the chiller circuit.

5.3.2 Pool Mode - (Auto Cool)

The Auto-Cool mode allows the unit to monitor the temperature of the water 24 hours a day. When the temperature of the water rises above the desired temperature setting, the control will then energize the unit.

To operate in pool mode with the Cooling Auto-Run feature, press **POOL**. The LED indicator will light and the unit will display the message **POOL TEMPERATURE SET-POINT = XX°** for 5 seconds.

After 5 seconds the display will read **POOL → HEAT** and the current pool temperature**.** Press **Heat-Cool**. The unit will display **POOL TEMPERATURE SET-POINT = XX°** for 5 seconds and the LED on the button will light. The display will read **POOL→COOL** along with the current pool temperature and the delay time remaining until the chiller starts.

Press **Time-Auto**. The unit will display **POOL TEMPERATURE SET-POINT = XX°** for 5 seconds and the LED on the button will light. Change the setting using the **Up** or **Down** buttons until you reach the desired set point. After 5 seconds of inactivity, the unit will display **POOL →AUTO-COOL** and the current pool temperature.

5.3.3 Spa Mode - (Auto Cool)

To operate in Spa Cool mode press **SPA**. The LED indicator will light on the **SPA** and the **Time/Auto** buttons and unit will display **SPA TEMPERATURE SET-POINT = XX°** for 5 seconds. Change the setting using the **Up** or **Down** buttons until you reach the desired set point. After 5 seconds of inactivity the display will read **SPA →AUTO-HEAT** along with the current spa temperature and the delay time left until the chiller starts. Additionally, the new set point will be stored in memory.

Press **Heat/Cool**. The **Heat/Cool** LED will light and the display will read **SPA TEMPERATURE SET-POINT = XX°** for 5 seconds. Change the setting using the **Up** or **Down** buttons until you reach the desired set point. The display will read **SPA →AUTO-COOL** along with the current water temperature after 5 seconds of inactivity. The new set point will be stored in memory.

5.4 Enabling Remote Control with AquaSwitch® Systems and All Other Dual TStat Remote Systems

NOTE Temperature setting for Pool or Spa are set at the heat pump.

1. Turn off the control panel.
2. Press and hold the **Time/Auto**, **Up** and **Down** arrow buttons for 5 seconds to enter the setup menu. The control panel will momentarily display **SETTING 01** then it will display the language that is used for the display.

NOTE: In this mode, pressing and releasing the **SPA** button will step though each setting in the setup menu. Each press of the **SPA** button will cause the display to momentarily show the setting number then show the value for that setting. Pause between button presses to allow the control time to respond.

3. Repeatedly press and release the **SPA** button until the display momentarily reads **SETTING 05**. The control panel will then display **AQUASWITCH DISABLED.**
4. Press the **Up** arrow button one time to enable remote control of the unit. The control panel will then display **AQUASWITCH ENABLED.**
5. Press and hold the **Time/Auto**, **Up** and **Down** arrow buttons for 5 seconds to exit the setup menu.

5.5 Enabling Remote Control with AquaLink® RS Systems

NOTE Temperature setting for Pool or Spa are set at the Aqualink RS indoor controller.

1. Turn off the control panel.
2. Press and hold the **Time/Auto**, **Up**, and **Down** arrow buttons for 5 seconds to enter the setup menu. The control panel will momentarily display **SETTING 01** then it will display the language that is used for the display.

NOTE: In this mode, pressing and releasing the **SPA** button will step though each setting in the setup menu. Each press of the **SPA** button will cause the display to momentarily show the setting number then show the value for that setting. Pause between button presses to allow the control time to respond.

3. Repeatedly press and release the **SPA** button until the display reads **SETTING 13**. The control panel will then display **AQUALINK DISABLED**.
4. Press the **Up** arrow button one time to enable remote control of the unit. The control panel will then display **AQUALINK ENABLED.**
5. Press and hold the **Time/Auto**, **Up** and **Down** arrow buttons for 5 seconds to exit the setup menu.

5.6 Advanced Digital Microprocessor Quick Guide

To operate your heat pump, simply select, then press the buttons corresponding to the operating mode you want to use. The associated LED indicator will light.

1. Press **Off/On** to turn heat pump on or off.
2. Select **POOL** or **SPA**. The heat pump control panel will display the current pool or spa temperature setting. Adjust the temperature set point up or down as desired.
3. The heat pump will run consistent with pool time clock for the pump. Press **Time/Auto** to enable the optional Auto-Heat. The heat pump will override the time clock and maintain/monitor the pool temperature 24 hours a day. To maintain the temperature, the heat pump will turn on at night.
4. The optional Heat/Cool feature is used with Reverse Cycle equipped heat pumps. Press **Heat/Cool** to reverse roles from heating to cooling the pool to the desired temperature.

5.7 Water Pressure Switch Adjustment

⚠ CAUTION

The water pressure switch should be adjusted to turn the heater off when the pump is off. Setting the switch to close at too low of a flow can damage the appliance. Adjust the switch to turn the heater off, not on.

⚠ ATTENTION

Le manocontact de pression d'eau doit être réglé de façon à ce que l'appareil cesse de fonctionner si la pompe s'arrête. Si le manocontact est réglé pour se fermer lorsque le débit d'eau est trop faible, l'appareil risque de s'endommager. Réglez le manocontact pour qu'il arrête l'appareil, et non pour qu'il le mette en marche.

The pressure switch is preset at the factory for activation at 2 psi (14 kPa). This is the minimum setting for the water pressure switch and works for all basic installations as shown previously in Section 3.1 and Section 3.5 in this manual. Only adjust the water pressure switch if the heat pump does not operate ***when the proper flow is applied to unit*** or if the heat pump does not shut off when the filter pump is off. Occasionally, unusual plumbing configurations or necessary restrictions in the plumbing may cause pressure sensing problems. In these rare situations, the plumbing system configuration may require adjustment of the water pressure switch.

Adjustment of the pressure switch may be necessary if any part of the filter system piping is 3 feet (0.91 m) or more above the top of the heat pump jacket.

Do not adjust the pressure switch if the heat pump is installed more than 15 feet (4.57 m) above or 6 feet

(1.83 m) below the pool surface. Consult your local Jandy representative for recommendations.

On some installations, the piping from the heat pump to the pool is very short. The back pressure could be too low to trigger the pressure switch. If this happens, it may be necessary to install a directional fitting or elbows where the return line enters the pool. This will increase back pressure enough for the heat pump to operate properly. If this configuration is necessary, be sure to check that the system flow is above the minimum requirement of 30 gpm after the direction fitting or elbow has been installed.

Make sure the pool filter is clean before making any pressure switch adjustment: A dirty filter will restrict the water flow and the pressure switch cannot be adjusted properly.

To adjust the pressure switch:

1. Be sure that all valves in the system are set to allow water flow through the heat pump. Start the filter pump.
2. Set the heat pump control to call for heat. Set the On/Off switch on the heat pump control to the ON position. If the heat pump was installed with the *Auto-Heat* feature, set the mode to TIME so that the heat pump will turn on if water is flowing through the heat exchanger.
3. If the heat pump control displays "LOW H_2O FLOW", then the flow in the system may be below the minimum flow of 30 gpm needed for the safe operation of the heat pump. Investigate and correct any flow problems before adjusting the water pressure switch.
4. Remove the heat pump's control access panel. The water pressure switch is located in the lower left corner of the control compartment.
5. After confirming the flow rate is at a minimum of 30 gpm, slowly rotate the thumb wheel on the water pressure switch in a **counterclockwise** direction until the "LOW H_2O FLOW" indicator disappears from the control display. Remember that there is a time delay before the heat pump compressor will start.
6. Once the heat pump is running, turn off the filter pump. The heat pump should turn off immediately.
7. If the heat pump continues to operate when the filter pump is off, turn the thumb wheel on the water pressure switch in a **clockwise** direction until "LOW H_2O FLOW" is displayed on the control and the heat pump shuts down.
8. Check the setting of the water pressure switch by starting and stopping the filter pump and checking the control display and operation of the heater between each flow change.
9. If the water pressure switch cannot be adjusted to accommodate the conditions listed above, an external flow switch must be added to the plumbing system to ensure that the heat pump will not operate without the proper flow through the heat exchanger.

Section 6. General Maintenance

6.1 Water Chemistry

Proper chemical balances are necessary for sanitary bathing conditions as well as ensuring your heat pump's long life. Be sure to keep your chemical and mineral concentration levels within the values indicated in Table 2.

Table 2. Optimal Water Chemistry Ranges

Test	Recommended Level
Free Chlorine or	1.0 to 3.0 ppm (3.0 to 5.0 spa)
Bromine	2.0 to 4.0 ppm (3.0 to 5.0 spa)
pH	7.4 to 7.6
Total Alkalinity (TA)	80 to 120 ppm
Calcium Hardness (CH)	200 to 400 ppm
Cyanuric Acid	30 to 50 ppm
Total Dissolved Solids (TDS)	Less than 2000 ppm
Copper	0 ppm
* Concentration levels taken from "Basic Pool and Spa Technology" published by NSPI (National Spa and Pool Institute).	

NOTE For spas, it is also necessary to perform water changes in addition to chemical treatment. It is recommended to change the spa water every 60 days for light usage and every 30 days if usage is heavy.

6.2 Winterizing

CAUTION
Failure to winterize could cause damage to the heat pump and will void the warranty.

ATTENTION
La garantie sera annulée si l'appareil n'est pas hivernisé convenablement.

In areas where freezing temperatures occur, you should protect your pump, filter, and heat pump from the elements. Perform the following steps to completely drain the heat pump (see Figure 14).

1. Turn off the electrical power to the heat pump at the main breaker panel.
2. Shut off the water supply to the heat pump.
3. Disconnect the water inlet and outlet unions located on the lower front panel of the heat pump.
4. Open the drain located on the lower front panel of the heat pump to drain the remaining water from the heat exchanger. Leave the drain open until the unit is ready for seasonal start-up.
5. Cover only the top of the heat pump to prevent debris from falling into the unit. Do not wrap the sides of the heat pump with any plastic or other material that will retain heat or moisture inside the unit.

6.3 Spring Start-Up

If your heat pump has been winterized, perform the following steps when starting the system in the Spring:

1. Uncover the heat pump and inspect the top and sides for any debris or structural problems.
2. Close the petcock located on the lower front panel of the heat pump.
3. Connect the water inlet and outlet unions located on the lower front panel of the heat pump.
4. Turn on the filter pump to supply water to the heat pump. Circulate water through the system long enough to cycle all of the pool water through the filter. Check for leaks in and around the heat pump.
5. Turn on the electrical power to the heat pump at the main breaker panel.

6.4 Inspection and Service

Jandy Heat Pumps are designed and constructed to provide long performance life when installed and operated properly under normal conditions. Periodic inspections are important to keep your heat pump running safely and efficiently through the years.

6.4.1 Owner Inspection

Jandy recommends that you inspect your heat pump on a continual basis and especially after abnormal weather conditions. The following basic guidelines are suggested for your inspection:

1. Keep the top and surrounding areas of the heat pump clear of all debris.
2. Keep all plants and shrubs trimmed and away from the heat pump.

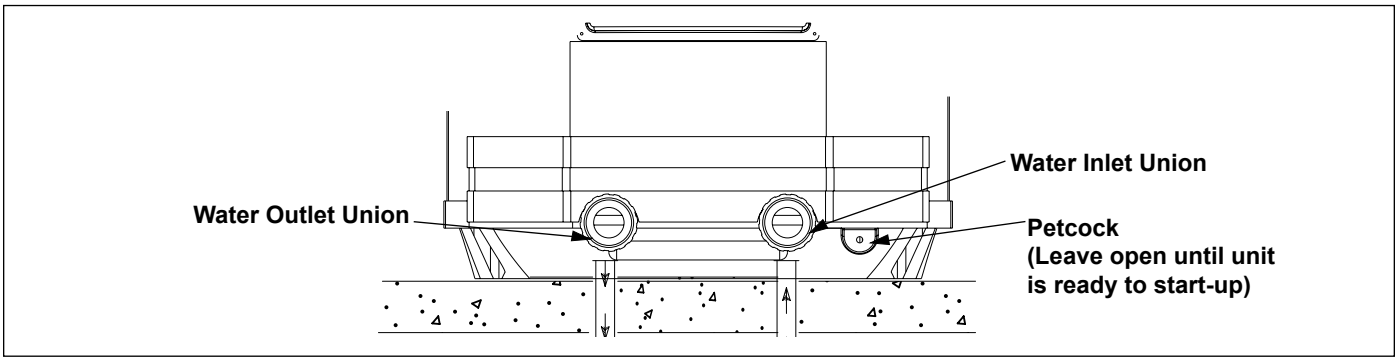


Figure 14. Winterizing the AE-Ti Heat Pump

3. Do not use this heat pump if any part has been under water. Immediately call a qualified professional technician to inspect the heat pump and replace any part of the control system which has been submerged.

The heat pump will produce condensation (water) while in operation. The heat pump base is designed to allow the condensation to exit through the bottom drain port when the unit is running. The condensation will increase as the outdoor air humidity level increases. Check the following at regular intervals to ensure proper condensate drainage:

1. Visually inspect and clear the bottom drain ports of any debris that could clog the ports.
2. Ensure that condensate water does not puddle inside the heat pump
3. Ensure that condensate run-off is properly directed away from the equipment pad to keep it from undermining the pad.

During normal operation, the heat pump produces three to five gallons of condensate per hour. If condensate drainage is above this range during operation or if water continues to drain from the base when the heat pump is not in operation for more than an hour, a leak in the internal plumbing may have occurred. Call a qualified heat pump technician to investigate the problem.

Keep the top air flow discharge and air flow intake area clear of debris so the air flow though the heat pump is not restricted. The cooler discharge air from the top should not accumulate and be drawn into the side air intake coils. Keep all plants and shrubs trimmed away from the heat pump.

Make sure the front of the unit is accessible for future service.

Keep lawn sprinkler heads from spraying on the heat pump to prevent corrosion and damage. Use a deflector if needed.

If the unit is installed under a very sharp roof pitch or under a roof without a gutter, a gutter or diverter should be fitted to prevent excessive water from pouring down into the unit.

6.4.2 Professional Inspection

Inspections performed at least once a year by a qualified technician are required to maintain your heat pump's safe and efficient operation. The following basic safety checks must be performed.

1 Check for loose or broken wires and terminal connections.

2. Verify the pressure switch operation. Turn the heat pump OFF. Disconnect the power to the pump time clock, or turn the pump time clock to an OFF position. Turn the heat pump back ON. The heat pump must not come on.
3. Inspect the electrical controls, specifically the following:

   a. High and Low limits

   b. Pressure switch

   c. Temperature control
4. Inspect the evaporator coil for blockage and clean as necessary.
5. Check for spider webs or debris in the condensate drain; clean if necessary.
6. Conduct a normal operating cycle and observe that the unit operates properly.

Section 7. Professional Maintenance and Service

7.1 Heat Pump Design

The Jandy Air Energy Heat Pump is one of the most efficient ways to heat a pool or spa. The heat pump transfers heat from the outside air to the pool or spa water by means of an internal heat exchanger.

When the fan is turned on, warm air is drawn through the refrigerant charged evaporator, turning the cold liquid refrigerant to a warm gas. The gas then flows through the compressor where it is compressed resulting in a much higher temperature.

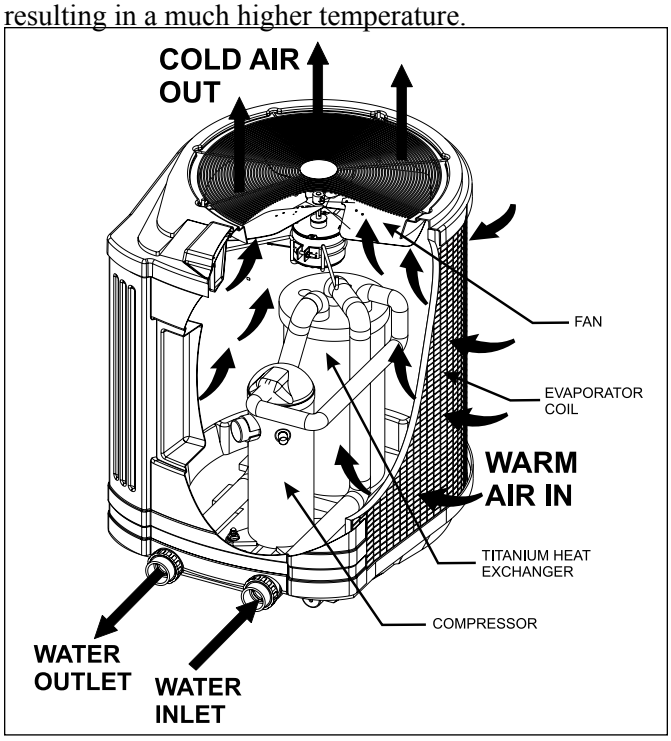


Figure 15. Heat Pump Operation Overview

The hot gas enters the heat exchanger where the water extracts the heat. The pump pulls in cool pool water, which in turn converts the hot gas back into a liquid refrigerant and starts the cycle over again.

NOTE The maximum heat output and efficiency of a heat pump is dependent upon the quality and performance of the major components used. As equally important are the environmental conditions (for example, air temperature, humidity, water temperature, and wind).

7.2 Heat Pump Components and Their Operation

Evaporator Heat is collected in the evaporator similar to a solar collector, which is a basic design for collecting heat. The larger the surface area of the evaporator, the more heat it can collect.

Fan The Heat Pump fan produces high volume airflow. Adequate airflow is required to transfer warm air to the large evaporator.

Compressor The compressor compresses the refrigerant gas to a higher pressure, thus increasing the temperature.

Heat Exchanger As the final step to the heating process, the heat exchanger transfers the heat from the hot gas to the water. (Also known as a condenser.)

Section 8. Troubleshooting

8.1 Troubleshooting Guide

SYMPTOM	CORRECTIVE ACTION
Heat pump will not start, no control board display.	Breaker or fuse may be tripped. Reset breaker or check fuse. If heat pump still does not run, call for service.
Heat pump will not start, control board display working.	Heat pump may be in delay count down of 5 minutes Make sure control board thermostat is calling for heater to come on (check setting on thermostat and temperature reading.) Make sure heat pump is not in cooling mode.
Heat pump runs but does not heat.	Verify cold air is blowing out the top of the heat pump. If the heat pump has just been installed or if the pool water has been allowed to cool significantly, it is necessary to run the heat pump continually for 24-48 hours. If the heat pump has been in operation for some time, increase the circulating pump time, or switch the control board to auto heat function. If heating a spa, verify no air intake stand pipes are open. If heat pump still does not heat call for service.
Heat pump does not run and control board displays LOW H_2O FLOW.	Verify circulating pump is on and all necessary valves are in the correct positions. Verify filter and skimmers are clean. Check water level in pool. Temporarily turn off all fountains and water falls that bypass the heat pump water inlet. If this does not correct the problem, call for service.
Heat pump does not run and control board display shows HIGH REFRIGERANT PRESSURE.	Verify circulating pump is on and that there are no water flow restrictions to the heat pump. Make sure all necessary valves are open or in the proper positions to allow proper water flow to the heat pump. Verify filter and skimmers are clean. Check for water level in the pool. This condition may also appear if the heat pump has not been operated for an extended period. To clear the condition, cycle the heat pump, on and off, up to 3 times. If this does not correct the problem call, for service.
Heat pump does not run or short cycles and control board display shows LOW REFRIGERANT PRESSURE.	Check that fan is operating and air is coming out of the top of the heat pump, while short cycling. If heat pump does not run at all, call for service.
Heat pump leaking water.	Possible heat exchanger or plumbing leak. Turn the heat pump off, then turn circulating pump on for at least one hour to see if the water leak stops. If the water leak stops, normal condensation is occurring. If the water leak continues, after the heat pump is shut off for at least one hour, call for service.

8.2 Diagnostics

In the event a pressure switch opens or another fault condition occurs, the LCD screen will display the fault until the problem has been resolved. Please refer to the following table for the list of diagnostic conditions.

Diagnostic Condition	Description
LOW H_2O FLOW	Low or restricted water flow through the heat pump. The external bypass valve is in the wrong position, or the water flow switch has malfunctioned. The water flow switch opens creating a fault and the heat pump shuts off. The LCD screen will display LOW H_2O FLOW on the top line until the switch closes. The ON LED will flash once every 2 seconds.
LOW COIL TEMPERATURE	When the evaporator coil temperature is below 30°F, the heat pump cannot operate effectively. The coil thermistor reads the temperature and the control goes into defrost if the defrost mode is not set to OFF in setup mode. The LCD display will display LOW COIL TEMP on the top line for the duration of the low coil temperature condition when the defrost mode is set to OFF. When set to either Air Defrost or Reversing Valve Defrost, the LCD display will show * Defrost Mode * for the duration of the low coil temperature condition.
LOW REFRIGERANT PRESSURE	When the ambient temperature is low, the suction pressure can drop significantly. This fault will cause the low pressure switch to open and the control will shut off the compressor. The LCD display will display LOW REFRIGERANT on the top line and PRESSURE on the bottom line for the duration of the fault condition. The ON LED will flash twice every 2 seconds.
HIGH REFRIGERANT PRESSURE	When the head pressure builds too high, the high pressure switch will open causing the heat pump to shut off immediately. The control will sense this fault condition and shut off the compressor until the switch re-closes. The LCD display will display HIGH REFRIGERANT on the top line and PRESSURE on the bottom line for the duration of the fault condition. The ON LED will flash 3 times every 2 seconds.
HIGH WATER TEMPERATURE	When the POOL or SPA water temperature heats to the maximum allowed temperature or above, there could be safety risks for anyone in the water. The water thermostat will read this temperature and the control will shut off the heat pump unless it is in CHILLER mode. The LCD display will display HIGH H_20 on the top line and TEMPERATURE on the bottom line for the duration of the fault condition. This feature also remains active when the control calls for heat through a remote thermostat. This is to insure that water temperature does not go to an abnormally high level due to a possible malfunction of the remote sensor.

Diagnostic Condition	Description
LOW WATER TEMPERATURE	When the POOL or SPA temperature chills to 50°F or below there could be safety risks for anyone in the water. The water sensor will read this temperature and the control will shut off the chiller. The LCD display will show LOW H_2O on the top line and TEMPERATURE on the bottom line for the duration of the fault condition. This feature also remains active when the control calls for chill through a remote thermostat. This is to insure that water temperature does not go to an abnormally low level due to a possible malfunction of the remote sensor.
COIL SENSOR PROBLEM	In the event that the coil temperature sensor malfunctions or is not connected the control will shut off the heat pump. The LCD display will show COIL SENSOR on the top line and MALFUNCTION on the bottom line until the problem is resolved.
WATER SENSOR PROBLEM	In the event that the water temperature sensor malfunctions or is not connected the control will shut off the heat pump. The LCD display will show WATER SENSOR on the top line and MALFUNCTION on the bottom line until the problem is resolved.

Section 9. Replacement Parts

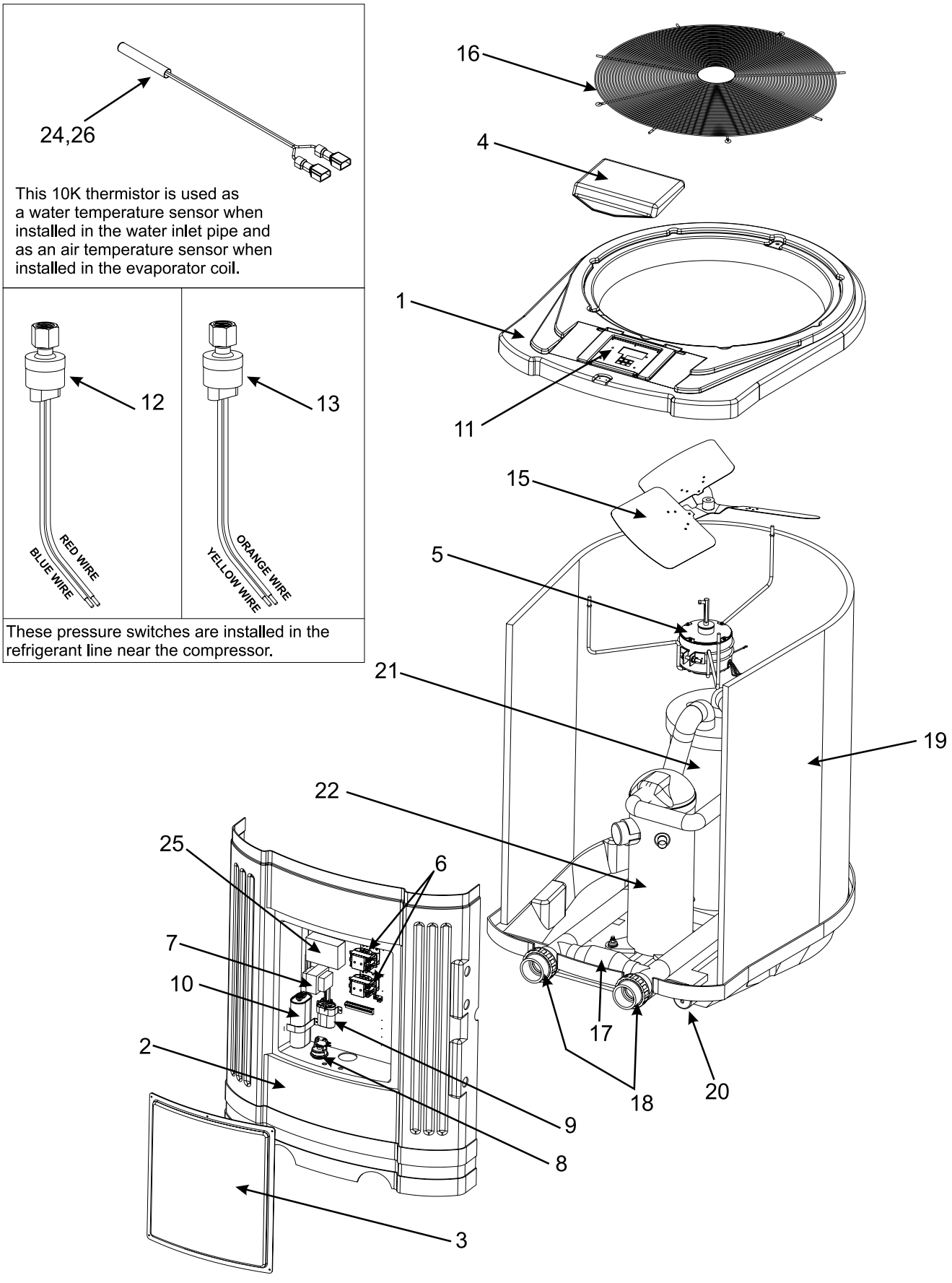
9.1 Ordering Information

To order or purchase parts for the AE-Ti models of heat pumps, contact your nearest Jandy dealer or distributor. See the Jandy web site at www.jandy.com for the nearest service center. If they cannot supply you with what you need, contact Jandy Customer Service Department at P.O. Box 6000, Petaluma, California, 94954, Telephone (707) 776-8200 extension 245.

9.2 Jandy AE-Ti Heat Pumps Parts List

Key No.	Description	Model No.	Order Part No.
1	Top Enclosure, Jacket	All	R3000200
2	Front Panel, Jacket	2000	R3000401
2	Front Panel, Jacket	2500,3000	R3000403
3	Service Access Panel	All	R3000500
4	Control Cover - Smoked	All	R3000600
5	Fan Motor, *208 VAC & 230 VAC*	All	R3000701
5	Fan Motor, *380 VAC & 460 VAC*	All	R3000702
6	Contactor, *1-Phase*	All	R3000801
6	Contactor, *3-Phase*	All	R3000802
7	Transformer, *1-Phase*	All	R3000901
7	Transformer, *3-Phase*	All	R3000902
8	Water Pressure Switch	All	R3001000
9	Capacitor, Fan Motor	All	R3001100
10	Capacitor, Compressor (55/440) Bristol	2000	R3001201
10	Capacitor, Compressor (60/370) Bristol	2500	R3001202
10	Capacitor, Compressor (80/370) Bristol	3000	R3001203
11	Controller Assembly	All	R3001300
12	Refrigerant HP Switch	All	R3001400
13	Refrigerant LP Switch	All	R3001500
14	Wire Harness Kit, 1-Phase (Not Shown)	All	R3001600
15	Fan Blade Set	All	R3001700
16	Fan Guard	All	R3001800
17	Plumbing Bypass Assembly	All	R3001900
18	2” PVC Union Set	All	R3002000
19	Evaporator Coil/Guard	2000	R3002101
19	Evaporator Coil/Guard	2500	R3002102
19	Evaporator Coil/Guard	3000	R3002103
20	Heat Exchanger Drain Kit	All	R3002200
21	Heat Exchanger Replacement Kit	All	R3002300
22	Compressor (55/440)	2000	R3002500
22	Compressor (60/370)	2500	R3002600
22	Compressor (80/370)	3000	R3002700
23	Thermal Expansion Valve (Not Shown)	All	R3002800
24	Water Temperature Sensor	All	R3002900
25	3-Phase Monitor	All	R3003000
26	Air Temperature Sensor	All	R3003100

9.3 Jandy AE-Ti Heat Pumps Exploded View



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LIMITED WARRANTY

Thank you for purchasing Jandy® pool and spa products. Waterpik Technologies (manufacturer of Jandy products, including Laars® pool and spa heaters, Air Energy Heat Pumps, and Clormatic Electronic Chlorine Generators) warrants all parts to be free from manufacturing defects in materials and workmanship for a period of one year from the date of retail purchase, with the following exceptions:

- AquaLink® RS units installed with Jandy Surge Protection Kits will be covered for two years.
- NeverLube® valves are warranted for the life of pool and/or spa on which they were originally installed.
- AquaPure™ Electronic Chlorine Generator Electrolytic Cells carry a 5 year limited warranty on a prorated basis.
- Heat pump titanium coils carry a limited lifetime warranty.

This warranty is limited to the first retail purchaser, is not transferable, and does not apply to products that have been moved from their original installation sites. The liability of Waterpik Technologies shall not exceed the repair or replacement of defective parts and does not include any costs for labor to remove and reinstall the defective part, transportation to or from the factory, and any other materials required to make the repair. This warranty does not cover failures or malfunctions resulting from the following:

1. Failure to properly install, operate or maintain the product(s) in accordance with our published Installation, Operation and Maintenance Manuals provided with the product(s).
2. The workmanship of any installer of the product(s).
3. Not maintaining a proper chemical balance in your pool and/or spa [pH level between 7.2 and 7.8, Total Alkalinity (TA) between 80 to 120 ppm, Total Dissolved Solids (TDS) less than 2000].
4. Abuse, alteration, accident, fire, flood, lightning, rodents, insects, negligence or acts of God.
5. Scaling, freezing, or other conditions causing inadequate water circulation.
6. Operating the product(s) at water flow rates outside the published minimum and maximum specifications.
7. Use of non-factory authorized parts or accessories in conjunction with the product(s).
8. Chemical contamination of combustion air or improper use of sanitizing chemicals, such as introducing sanitizing chemicals upstream of the heater and cleaner hose or through the skimmer.
9. Overheating; incorrect wire runs; improper electrical supply; collateral damage caused by failure of O-Rings, DE grids, or cartridge elements; or damage caused by running the pump with insufficient quantities of water.

LIMITATION OF LIABILITY:

This is the only warranty given by Waterpik Technologies. No one is authorized to make any other warranties on Waterpik Technologies' behalf. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. WATERPIK TECHNOLOGIES EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT OR PUNITIVE DAMAGES FOR BREACH OF ANY EXPRESSED OR IMPLIED WARRANTY.** This warranty gives you specific legal rights. You may also have other rights which vary by state or province.

WARRANTY CLAIMS:

For prompt warranty consideration, contact your dealer and provide the following information: proof of purchase, model number, serial number and date of installation. The installer will contact the factory for instructions regarding the claim and to determine the location of the nearest designated service center. If the dealer is not available, you can locate a service center in your area by visiting www.jandy.com or by calling our technical support department at (707) 776-8200 extension 260 [for heap pumps call (954) 970-4800]. All returned parts must have a Returned Material Authorization number to be evaluated under the terms of this warranty.

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